



The Scientific Bases of Regulations as a Vehicle for Capacity Development in Rural Communities Served by Small PWS

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SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- PAHO figures for diarrheal disease
- 62,227,000 dalys (disability adjusted life years) for 2000 lost to diarrheal disease





SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- Urban services specialists are coming to realise that sustainability of infrastructure interventions depends on community engagement in operation and maintenance (O&M). But what progress has been made in getting urban communities involved in the planning, construction, repair and maintenance of water supply and sewerage systems? Are projects demand-driven and are communities willing to pay to look after them?
- M. Sohail, S. Cavill & A.P. Cotton. 2001. *Operation, maintenance and sustainability of services for the urban poor: findings, lessons learned and case studies*. Water, Engineering and Development Centre. Univ of Loughborough, UK.

SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- Divide between perceptions of science in communities and agencies





Public and agency understanding of municipal solid waste regulation in Puerto Rico (PERCEPTIONS STUDIES)

- Methods - 488 interviews
 - Personnel from 45 municipalities – different areas
 - Federal and Commonwealth agencies
 - 160 of the surveys were administered in 35 municipalities by course members in *Public Administration and the Management of Solid Waste* (2000)
 - Surveys were administered prior to educational activities
 - Questions measured perception, knowledge, attitude and aptitude



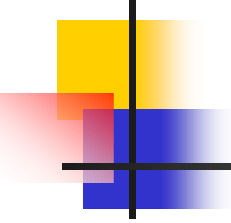
Public and agency understanding of municipal solid waste regulation in Puerto Rico (PERCEPTIONS STUDIES)

- 29% answered questions over how much MSW their municipality or regulated municipalities produced
 - Half of these (15%), used general data for the Island and not for their municipality, e.g, 4.5 llbs of solid waste per family per day.

Public and agency understanding of municipal solid waste regulation in Puerto Rico

- Asked if they had read the law they were implementing or enforcing only 3 of the 484 responding (0.6%) had.





Public and agency understanding of municipal solid waste regulation in Puerto Rico

- As to knowledge of the law, 29% answered incorrectly that the law applied to citizens, and 16% answered correctly.
- 46% admitted that they did not understand the law (although only 0.6% had read it).
- The remainder did not answer the questions.

Public perceptions of potable water in Puerto Rico





Public perceptions of potable water in Puerto Rico

- 90% of the population uses AAA
- Approximately 10% use water from private systems
 - Belong to neighbors in communities
 - Occur in 50 (of 76) municipalities



Public perceptions of potable water in Puerto Rico

- Data from CECIA studies suggest that the number of system is around 500
 - And these will stay outside the inventory of CWS if the do not have 15 services or 25 users.
- There are about 250,000 users in thesem systems



Public perceptions of potable water in Puerto Rico

- There was resistance in the communities to abandoning their systems
 - They perceived their water was better than AAA
 - They generally knew that their systems were more reliable in supplying water than AAA
 - This latter did not include consideration of the quality or potability of that water



Public perceptions of potable water in Puerto Rico

Opinion of PRASA water

	Number	Percent
good	71	21.3%
OK	157	47.0%
bad	103	30.8%
Don't know	3	0.9%
Total	334	100.0%
No response	39	



Public perceptions of potable water in Puerto Rico

Opinion of my water		
	Number	Percent
good	279	79.5%
OK	60	17.1%
bad	10	2.8%
Don't know	2	0.6%
Total	351	100.0%
No response	22	



Public perceptions of potable water in Puerto Rico

Opinion PRASA vs. Opinion of my water

Opinion of PRASA	Opinion of my water				Total
	Good	OK	Bad	Don't know	
Good	58	9	2		69
OK	110	42	3	2	157
Bad	91	6	5		102
Don't know	1	2			3
Total	260	59	10	2	331



Public perceptions of potable water in Puerto Rico

Perceived Reasons for Potable Water Regulations		
	Number	Percent
Protect health	295	93.4%
To bother us	5	1.6%
Give government employees work	2	0.6%
Take my money	11	3.5%
Don't know or Other	3	0.9%
Total	316	
No response	57	

SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- Support strong partnerships to help identify best practices for effective collaboration
 - CAP
 - Caguas *Centros de autogestión*
 - Networking through formal and informal training



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Formal Capacity Development

- Education
 - Administrator of water systems
 - Operator of water systems
- Research
 - Perceptions & educational needs
 - Technological
 - Socio-economics
- Outreach



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■ Informal capacity development:

- Workshop sequence (one per month for two years) to be offered in the communities to community members
- Workshops for board members
- Summer environmental schools for kids
- Teacher enhancement program
- Government personnel training



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- Capacity development for *all* members of the communities
(continued)
- Develop an on-site community data bank which will include:
 - Demographics
 - Watershed
 - Infrastructure
 - Water quality
 - Administrative issues





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- To develop an on-site community data bank
 - RCAP Solutions mapping, needs assessment and technical assistance in project communities
 - CECIA technical assistance
 - Both:
 - Provide meaningful, useful administrative, management and operations experience and training
 - Coordinated with practical portions of formal training
 - Transfer ***ability*** and not just information

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■ Environmental Justice Centers:

- Provide the communities with training in and access to information on:
 - Funding (Federal & Commonwealth)
 - Laws & Regulations
 - Environmental Justice
 - Watershed Management
 - Links to WEB sites (EPA, USDA, etc.)





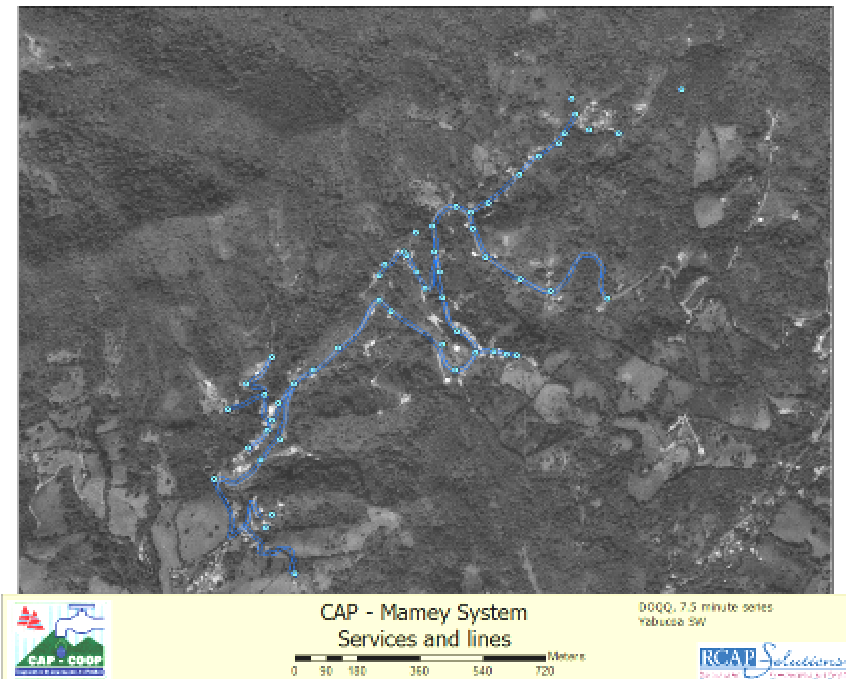
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- Establish a surveillance system to identify factors that make the communities vulnerable to contaminants that can be used in cumulative risk assessment
 - Coordination of CAP and CDR/DPNR work to establish forest preserves in watersheds of these systems
 - SWAP in communities – risk inventories in GIS by and with community members

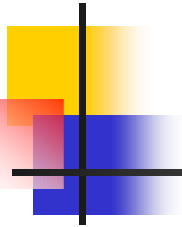
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- A community data bank which will provide opportunity for:
 - Training in data collection, entry and analyses
 - The use of data in planning, scoping and management
 - Maintenance and update of data to be used in management of community resources and in the search for funding

Where are we in terms of data collection?



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■ Environmental Justice Centers:

- Technical support for the use of the materials
- Site for networking and cooperative business
- *Support and encourage better leveraging of existing resources to advance local efforts to promote community revitalization (Cooperatives) – Ricardo Rivera, CDR*





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- What do we need?
- What would we like?



SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

Protecting Public Health in Small Water Systems
(Montana State University, May2004)

- Review models used around the globe to deal with risks management in water systems
- Collect data to correlate risks and illness (risk of exposure)
- Develop rapid methods for routine monitoring
- Improve remote control of water works
- Develop materials resistant to colonization and chemical contaminants



SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- Protecting Public Health in Small Water Systems
(Montana State University, May2004)
 - Research the impact of culture and religion in the management of risks
 - Review funding and capacity development strategies
 - Review current techniques and their application to small potable water systems
 - Develop demographic information and profiles of spw communities.



SAFE DRINKING WATER FOR REMOTE LOW-INCOME COMMUNITIES IN PUERTO RICO

- Protecting Public Health in Small Water Systems
(Montana State University, May2004)
 - Research the application of current policies to watershed management in spws
 - Research how information is communicated and applied in spws
 - Research and develop strategies to incorporate users (customers) in the administration of the systems and to represent these communities in policy development forums
 - Improve user knowledge of water issues